Remarks

In response to the rejection under 35 U.S.C. §103 for obviousness of various claims over Rabenko, the following comments are made:

The Examiner has acknowledged that Rabenko does not show the distinctive claim features of using consecutive time slots for sending a packet of at least 575 bytes without segmentation of the packet. The Examiner has tried to argue that it is obvious to reach these distinctive features starting from Rabenko because Rabenko indicates that the bandwidth can be adjusted based upon the length of the data. Applicants explained in the last response that it is not obvious to reach these distinctive features because normally transmitting such a packet would require many time slots and there would be gaps between the time slots, so the packet would need to be segmented. The gaps and the segmentation would normally involve added overhead, for example to indicate a start or finish or size of a segment and a label to identify a segment or indicate an order of the segments. The advantages of the distinctive feature of sending such a long packet without segmentation were explained, to help show non obviousness.

The Examiner has disregarded these stated advantages on the unusual ground that the claim does not recite these advantages. This seems to imply that claims should recite the advantages of their features, or that any advantages not recited in the claim can be disregarded. If this unusual rejection is maintained, some explanation of the legal basis for this would be appreciated.

The claims have now been amended to clarify that the head end allocates the consecutive time slots, that the subscriber station has framing apparatus and synchronization apparatus, and that the synchronization apparatus sends a frame with a guard band determined without using ranging. There is no new matter since dispensing with ranging is described at page 7 for example, and Fig 1 and the description at page 6 show framing and synchronization module 112. These features help clarify the distinctions over Rabenko, and as they

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relate to issues already addressed, there is no question of such amendments raising new issues.

Rabenko has a passage (col 7 lines 39-57) which states:

> "The request contention region 112 CM transmit opportunity 114 and maintenance region 116 typically begin at the beginning of an interval 110 and end at the end of an interval 110. However, each request contention region 112, CM transmit opportunity 114 and maintenance region 116, may begin and end anywhere as desired. Thus, variable duration request contention regions 112, CM transmit opportunities 114 and maintenance regions 116 are provided. Such variable duration request contention regions 112, transmit opportunities 114 and maintenance regions 116 facilitate flexible operation of the CM system and enhance the efficiency of data communications on the CM system by tending to mitigate wasted channel capacity.
>
> The current MAP 170 is transmitted in the downstream channel 111 after transmission of a previous MAP 90 and before any subsequent MAPs 91. Data, such as data packets associated with web pages, e-mail, cable television, pay-per-view television, digital telephony, etc. are transmitted between adjacent MAPs 90, 170, 91."

But this goes no further than indicating that the transmit opportunity can have a variable length, without detailing an example or a limit on the length before a packet should be segmented. As explained in a previous response, sending such a long packet without segmentation, would normally conflict with the requirement to limit latency, in other words limit the wait time for other subscribers. Hence this normally would not be allowed by existing PON standards, but it has now been recognized that it has a number of advantages. Transport packets such as IP packets can be transmitted without the complexity of recombining the segments. The complexities include addressing or sequencing indicators to enable the segments to be recombined correctly at the far end. Also it means that ranging to set different guard band times can be dispensed with to simplify the PON further.

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There is no suggestion in Rabenko of framing a packet of at least 576 bytes directly without segmentation, to send to the head station in consecutive time slots, nor that a guard band can be determined without the use of ranging.
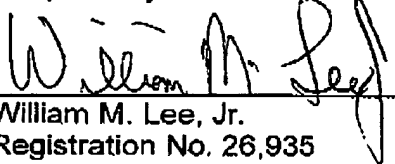
As explained previously, Rabenko teaches changing the bandwidth in response to demand. However this is not achieved by expanding a frame of the TDMA protocol, but by altering the proportion of slots allocated to a subscriber. As shown in Fig 3, these time slots are not all consecutive, but are interspersed with slots allocated to other users 114, with maintenance slots 116 and contention slots 112. There is no suggestion that when the number of slots is increased for a given user, that the slots must be consecutive. Furthermore, there is no suggestion that the extra bandwidth is related to longer packets, so it must be assumed that it simply means more short packets, since the document is concerned with short voice packets. Hence this effectively confirms that it would not be obvious to contemplate sending longer packets unless they were segmented.

All the claims now have corresponding distinctive features, or are dependent on such claims, and so are all submitted to be allowable for the same reasons.

All the points raised have been dealt with, all the claims are believed to be allowable and reconsideration is requested.

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